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FUGRO WEST, INC.



SUPPLEMENTAL SITE ASSESSMENT REPORT

SHELL SERVICE STATION
3801 SEPULVEDA BOULEVARD
CULVER CITY, CALIFORNIA

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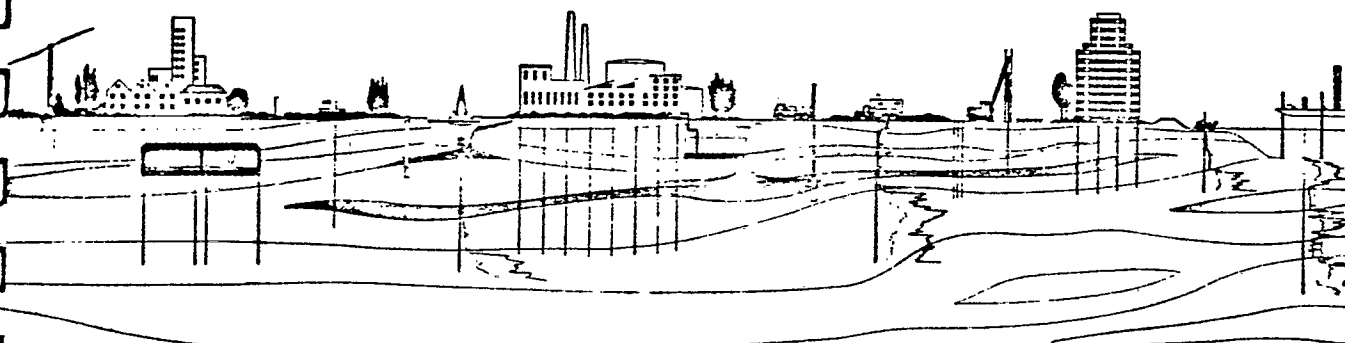
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COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
WIC 204-1944-0100
LADPW PROJECT I-7099

August 1994

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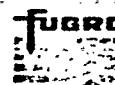
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Sincerely,
FUGRO WEST, INC.

REGISTERED GEOLOGIST
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ENGINEERING
GEOLOGIST
STATE OF CALIFORNIA

**c: Mr. Mike Claudio, Shell Oil Company
Mr. Al Novak, RWQCB, Los Angeles Region
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INTRODUCTION

This report presents the results of supplemental assessment activities conducted at the Shell service station, 3801 Sepulveda Boulevard, Culver City, California. Supplemental assessment activities included installing seven step-out soil borings, completing three of the soil borings as ground water monitoring wells, completing the remaining four soil borings as vapor extraction wells, soil and ground water sampling, laboratory analysis, and the preparation of this report. Supplemental assessment activities were conducted in accordance with a Site Assessment Plan, prepared by Fugro West, Inc. (formerly Fugro-McClelland), dated November 19, 1993. The Site Assessment Plan was approved by the County of Los Angeles, Department of Public Works, Waste Management Division, Local Oversight Program (LOP), in a letter dated December 23, 1993. Pursuant to a telephone conversation with Ms. Massey Munroe with the LOP on August 3, 1994, the deadline for submitting this report was extended until August 31, 1994.

PREVIOUS WORK

On June 19, 1992, four 12,000-gallon fiberglass underground fuel storage tanks, associated product piping, and five fuel dispensers were removed from the subject site (Plate 1 - Site Location Map). Tank, piping, and dispenser removal were performed by JMC Construction under the supervision of Inspector Marty Kutyllo with the Culver City Fire Department. The removed tanks were transported offsite for proper disposal. Verification soil samples were collected beneath the tanks, piping, and dispensers under the supervision of Inspector Ifeanyichukweu Azie with the LOP. Verification soil sample locations are shown on Plate 2 - Tank, Piping, and Dispenser Removal Verification Soil Sample Locations. Verification soil sample laboratory results are presented in Table 1 - Tank, Piping, and Dispenser Removal Verification Soil Sample Laboratory Results. Following the removal of the tanks, the excavation was enlarged and five new 12,000-gallon-capacity tanks, associated piping, and new dispensers were installed.

During August and September 1993, Fugro installed three soil borings to assess gasoline-impacted soil discovered during the tank removal. Two of the soil borings were completed as nested ground water monitoring/soil vapor extraction (SVE) wells (MW-1 and MW-2, Plate 3 - Site Map). The third soil boring was completed as a single SVE well (VE-3, Plate 3). Soil and ground water sampling laboratory results are included in Table 2 - Soil Boring-Soil Sample Laboratory Results, and Table 3 - Ground Water Sample Laboratory Results, respectively.

Assessment results were presented to the LOP in a Site Assessment Report, prepared by Fugro, dated October, 11, 1993. A description of the geologic conditions encountered in the three initial soil borings is incorporated into the Site Assessment Results section of this report.

HYDROGEOLOGIC SETTING

The Shell service station is located on the southwest corner of the intersection of Sepulveda and Venice boulevards in Culver City, California (Plate 3). Mobil and Chevron service stations are located on the southeast and northwest corners of the intersection, respectively (Plate 4 - Adjacent Land Use Map). The northeast corner of the intersection is presently occupied by a strip mall; this site was previously occupied by a Phillips 66 service station. Surrounding land use is commercial along major streets and residential between major streets. The San Diego Freeway is about one block west of the station.

The site is located on the Los Angeles Coastal Plain. This plain is an accumulation of marine and nonmarine sediments deposited over Tertiary-age bedrock. The alluvial section below the site is hundreds to thousands of feet thick. The project site is located in the southeastern portion of the Santa Monica Ground Water Basin, a hydrologic subunit of the Los Angeles Coastal Plain (California Department of Water Resources [DWR], 1961). The basin is bounded on the east by the Newport-Inglewood uplift, on the north by the Santa Monica Mountains, on the south by the Ballona Escarpment, and on the west by the Pacific Ocean.

Surface sediments in the vicinity of the project site consist of recent alluvial sediments made up of interbedded clays, silts, and silty sands, with occasional poorly sorted gravels typical of alluvial fan deposits (DWR, 1961). The recent alluvial section in this area consists of the Bellflower aquiclude and the Ballona aquifer. The Bellflower aquiclude, which is generally considered to restrict vertical movement of ground water (DWR, 1961), extends from the ground surface to a depth of approximately 20 feet. The underlying Ballona aquifer extends from the base of the Bellflower aquiclude to a depth of approximately 40 to 60 feet below the ground surface. Beneath the recent sediments lies the Lower Pleistocene San Pedro Formation. The Upper Pleistocene Lakewood Formation is not present in this area.

Ground water occurs in sediments of the San Pedro Formation at depths of 80 feet or more below the ground surface in this area (City of Los Angeles, Department of City Planning, 1974). Regionally, ground water in the Santa Monica basin flows mainly to the south towards Ballona Gap (DWR, 1961). Ground water pumping or recharge may affect local conditions.

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The base of fresh water-bearing sediments in this area occurs at a depth of approximately 350 feet below the ground surface (DWR, 1961).

A Mobil service station east (upgradient) of the subject Shell site has reported a subsurface release of gasoline. This Mobil station, located at 3800 South Sepulveda Boulevard, Culver City (Mobil station 11-FX5) is under Los Angeles Department of Public Works oversight (LADPW file I-7021). Gasoline releases reported by Mobil have impacted ground water. Up to 14 feet of free product has been identified in wells drilled as part of the assessment of that site. Wells installed offsite to the west of the Mobil station and directly upgradient from the Shell station have free product and detectable levels of total petroleum hydrocarbons and benzene, toluene, ethylbenzene and total xylenes. Based on the most recent assessment report reviewed (report by Remedial Management Corporation for Mobil, dated December 18, 1991), the western (downgradient) extent of gasoline hydrocarbons from the Mobil station has not been defined.

SUPPLEMENTAL SITE ASSESSMENT METHODOLOGY

Soil Borings

Subsurface conditions at the site were explored by drilling and sampling seven soil borings between April 18 and 27, 1994. The borings were advanced by Gregg Drilling with a Mobil B61, hollow-stem-auger drill rig under the direction of a Fugro field geologist. The soil borings were completed to depths between 95 and 120 feet. The locations of the borings are shown on Plate 3.

Boring VE-5 was continuously cored. Soil samples from the remaining borings were obtained at 5-foot intervals from a depth of 5 feet to the total depth of borings. Soil samples were obtained by driving a California Liner sampler, using a 140-pound hammer dropped 30 inches. Samples with field evidence of contamination (olfactory or photoionization detector [PID]) were recovered in stainless steel liners, sealed with Teflon sheets and plastic end caps, labeled, and placed on ice for transport to a state-certified laboratory for chemical analysis. Prior to each sampling attempt, the sampler and sample liners were decontaminated by washing with a nonphosphate solution followed by successive rinses with potable and deionized water.

Soils retained in the sampler shoe were visually classified and observed for signs of contamination. A field screening for volatile organic compounds (VOCs) was performed on unsaturated soil samples using a Photovac Microtip PID. Descriptions of the soil conditions

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encountered in each boring and field PID readings are presented in the boring logs, Appendix A - Boring Logs. A key to terms and symbols used on logs is included in Appendix A. All soil excavated during the drilling program was stored onsite in DOT approved 4-cubic-yard capacity bins. Soil disposal manifests are included as Appendix E of this report.

Hydropunch Ground Water Sampling

The approved Site Assessment Plan called for collecting ground water samples using a Hydropunch sampling tool. Because of the presence of dense sands beneath the site, the Hydropunch tool could not be driven more than 3 inches below the bottom of the borehole in the first boring attempted, VE-5. Furthermore, while trying to retract the protective sleeve to expose the Hydropunch screen, the tool broke off the drill rod and was lost downhole. The Hydropunch tool was retrieved by overdrilling the tool with the hollow-stem augers and cementing the tool inside the augers using plaster of paris. Additional Hydropunch sampling was not attempted.

Ground Water Monitoring Well and Vapor Extraction Well Installation

Well MW-3 was completed as a single, 4-inch-diameter, PVC ground water monitoring well. Wells MW-4/VE-6 and MW-5/VE-7 were completed as nested ground water monitoring/SVE wells. These nested wells contain a 4-inch-diameter PVC ground water monitoring well and a 2-inch-diameter PVC SVE well. Wells VE-4, VE-5, and VE-8 were completed as nested SVE wells with two or three, 2-inch-diameter, PVC SVE wells per borehole. Wells VE-9a and -9b, installed within a few feet of each other, each contain one, 2-inch-diameter, PVC SVE well. Well construction details are presented on the boring logs (Appendix A). Well materials included schedule 40 PVC riser and well screen (0.02 inch slot size), No. 3 sand (for ground water monitoring wells), coarse aquarium sand (for SVE wells), and bentonite chips for the annular seal. Monitoring well screen slot size and filter pack characteristics were determined based on the results of a sieve analysis performed on a sample collected from below the water table in boring VE-5. Sieve analysis results are included in Appendix B - Well Permit, Encroachment Permit, Surveyor's Report, Sieve Analysis. The ground water monitoring wells were surged with a bailer prior to installing the annular seal to allow the filter pack to settle. Ground water monitoring wells were installed in accordance with a permit obtained from the County of Los Angeles, Department of Health Services (Appendix B). Drilling operations that blocked public sidewalks were conducted in accordance with a public work-engineering permit obtained from the City of Culver City (Appendix B). The locations of the seven new wells and the three previously existing onsite wells, and the elevation of the traffic covers were surveyed by a licensed surveyor (Appendix B).

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Well Development

Ground water monitoring wells MW-3 and MW-4 were developed by Wayne Perry Construction, Inc. (Wayne Perry), on June 24 and 30, 1994, respectively. Well MW-5 was not developed because of the presence of measurable amounts of separate phase hydrocarbons. Development procedures are presented in a *Hydrocarbon Recovery and Groundwater Monitoring Report for the Period April through June 1994*, prepared for the subject site by Wayne Perry, dated July 29, 1994 (Appendix C - Wayne Perry Construction, Inc., Hydrocarbon Recovery and Groundwater Monitoring Report).

Well Gauging and Ground Water Sampling

Ground water monitoring wells MW-1, MW-4, and SVE wells VE-4, VE-5, and VE-9 were gauged and sampled by Wayne Perry on June 30, 1994. Ground water monitoring well MW-3 was gauged and sampled by Wayne Perry on July 1, 1994. SVE well VE-8 was not sampled by Wayne Perry. Wayne Perry gauged the short well of a two well nest and determined the well to be dry. A duplicate sample was obtained from monitoring well MW-4. Separate phase hydrocarbons were observed in monitoring wells MW-2 (8.01 feet) and MW-5 (3.73 feet).

Because ground water samples could not be collected at the locations of the SVE wells using the Hydropunch sampler as proposed in the approved work plans, SVE wells were completed approximately 5 feet below the water table to allow collection of ground water samples. SVE wells contain a filter pack of coarse aquarium sand, were not designed as ground water monitoring wells, and were not properly developed. Consequently, SVE wells will not be sampled during subsequent quarterly ground water monitoring. The SVE wells should, however, provide a one time ground water sample equivalent in quality to that which would have been obtained by a Hydropunch tool.

Free-Product Recovery

Separate phase gasoline was recovered from wells MW-2 and MW-5 by Wayne Perry. Free-product recovery data and procedures are described in Appendix C. Gauging and manual pumping operations were performed weekly during the period April through June 1994. Approximately 99 gallons of separate phase hydrocarbons were recovered during that period. Since manual recovery operations began in November 1993, 248 gallons of separate phase hydrocarbons have been recovered at the site.

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SITE ASSESSMENT RESULTS

Hydrogeologic Conditions

Earth materials encountered during drilling of seven soil borings are described in the boring logs (Appendix A). Subsurface conditions are illustrated on two cross sections, Plate 5 - Cross Section A-A' and Plate 6 - Cross Section B-B'. The orientation of the cross section lines is shown on Plate 3. In general, earth materials encountered beneath the site may be grouped as follows:

Artificial Fill

0 to 3 feet - silty clay, clayey sand and silty sand

Quaternary Alluvium

3 to 13 feet - Bellflower aquiclude - clay, silty clay and clayey silt

13 to 30 feet - Interfingering contact between the Bellflower aquiclude and the Ballona aquifer

30 to 90 feet - Ballona aquifer - fine to coarse grained sand and gravelly sand

90 to 120 feet - Interfingering contact between the Ballona aquifer and the San Pedro Formation aquiclude (clay, clayey sand and clayey silt)

Ground water was encountered at a depth of between approximately 88 (MW-3) and 101 feet (MW-4). Table 4 - Well Gauging Data, presents gauging data for the onsite and offsite wells. Based on these data, the ground water flow direction beneath the site was calculated to be to the west at a variable gradient. Between wells MW-3 and MW-1, the hydraulic gradient was calculated to be 0.14 (14 feet vertical per 100 feet horizontal). Between wells MW-1 and MW-4, the hydraulic gradient was calculate to be 0.005. Ground water elevation contours are shown on Plate 7 - Ground Water Elevation Contour Map. Free product was measured in wells MW-2 and MW-5. Recovery of free product from wells MW-2 and MW-5 by weekly bailing/air lift pumping was initiated on September 20, 1993.

Laboratory Analyses

Soil and ground water samples were analyzed for TPH-gasoline (EPA method 8015 modified), and BTEX (EPA 8020), by Crosby Laboratories. Table 2 - Soil Sample Analysis, presents the results of laboratory analyses performed on soil samples. Table 3 - Ground Water

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Sample Analysis, presents the results of laboratory analyses performed on ground water samples. Laboratory transcripts are presented in Appendix D - Laboratory Transcripts. As described in our assessment proposal, organic lead analyses were not performed as part of this subsequent assessment.

Discussion

Subsurface conditions encountered during the installation of three previously existing and seven additional soil borings are illustrated on Plates 5 and 6. TPH-gasoline concentrations in soil samples collected at depths of 25, 50, and 75 feet and at the capillary fringe are illustrated on Plates 8, 9, 10 and 11, respectively.

Based on the soil sampling and laboratory analyses performed, the lateral and vertical limits of gasoline impacted soil beneath the site appear to be fully defined. Gasoline impacted soil is limited to the vicinity of wells MW-1, MW-2, and VE-3. Soil contamination extends to the water table at a depth of approximately 100 feet.

Ground water exists at depths between approximately 88 and 101 feet in the vicinity of the site. Ground water elevation contours and the ground water flow direction are presented on Plate 7. TPH-gasoline and benzene concentrations in ground water, as well as isoconcentration contours are presented on Plates 12 and 13, respectively. Based on the ground water sampling and laboratory analyses performed, gasoline impacted ground water and separate phase hydrocarbons are present beneath the subject Shell service station and the adjacent property to the west. Additionally, a second free phase hydrocarbon and dissolved gasoline plume has migrated onto the eastern portion of the Shell site. The source of the second plume is likely the upgradient Mobil service station or carwash.

Shell is currently in the process of installing a free product recovery system and a soil vapor extraction system at the site. Ongoing manual free product recovery will continue until the automated system is online.

Limitations

This report has been prepared for the County of Los Angeles Department of Public Works Underground Storage Tank Local Oversight Program, on behalf of the Shell Oil Company, as a field assessment of subsurface conditions at the Shell service station located at 3801 Sepulveda Boulevard, in Culver City, California. In performing our professional services, we have attempted to apply present engineering and scientific judgment and use a level of effort consistent with the standard of practice measured on the date of this report, and in the locale of

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the project site for similar type studies. Fugro West, Inc., makes no warranty, express or implied.

The analysis and interpretations in this report have been developed based on the results of limited laboratory analyses performed on soil and ground water samples collected at discrete locations on the project site. It should be noted that subsurface conditions can vary laterally and with depth below a given site. Fugro is not responsible for errors or omissions associated with free product recovery and quarterly ground water monitoring being performed by Wayne Perry.

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REFERENCES

- California Department of Water Resources (DWR) (1961), *Planned Utilization of the Ground Water Basins of the Coastal Plain of Los Angeles County*, Appendix A, Ground Water Geology Bulletin 104; California Department of Water Resources, Southern District, Los Angeles, California.
- City of Los Angeles Department of City Planning (1974), *Generalized Map of Depth to Ground Water, City of Los Angeles*, prepared by Engineering Geology Consultants, Inc.: in J.H. Wiggins Co. *Seismic Safety Analysis, City of Los Angeles*, prepared for the Department of City Planning, Los Angeles, California.
- Remedial Management Consultants (1991), *Site Assessment for Mobil Oil Station 11-FX5, 3800 South Sepulveda Boulevard, Culver City, California*, Remedial Management Consultants, Newport Beach, California.

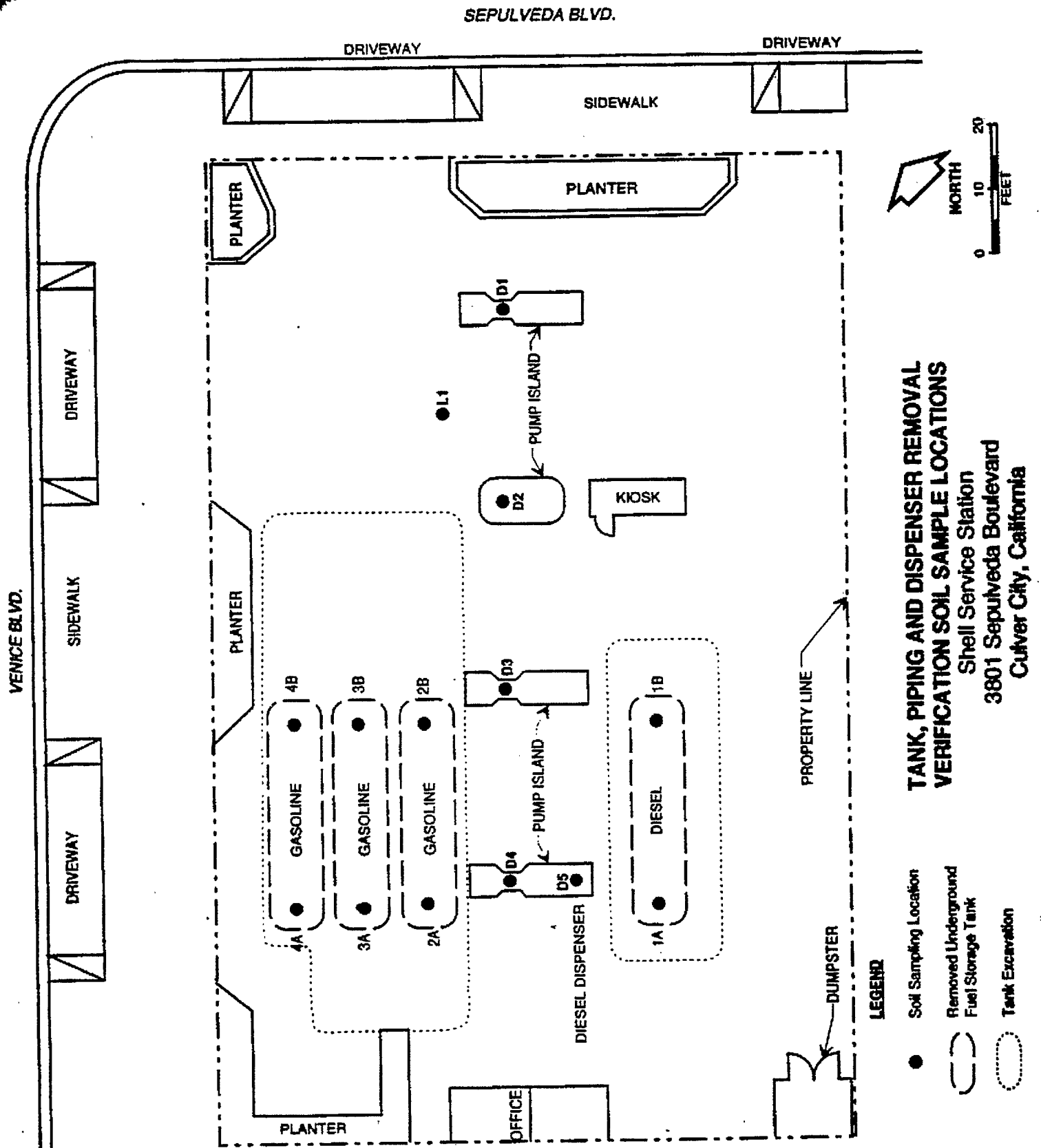


PLATE 2

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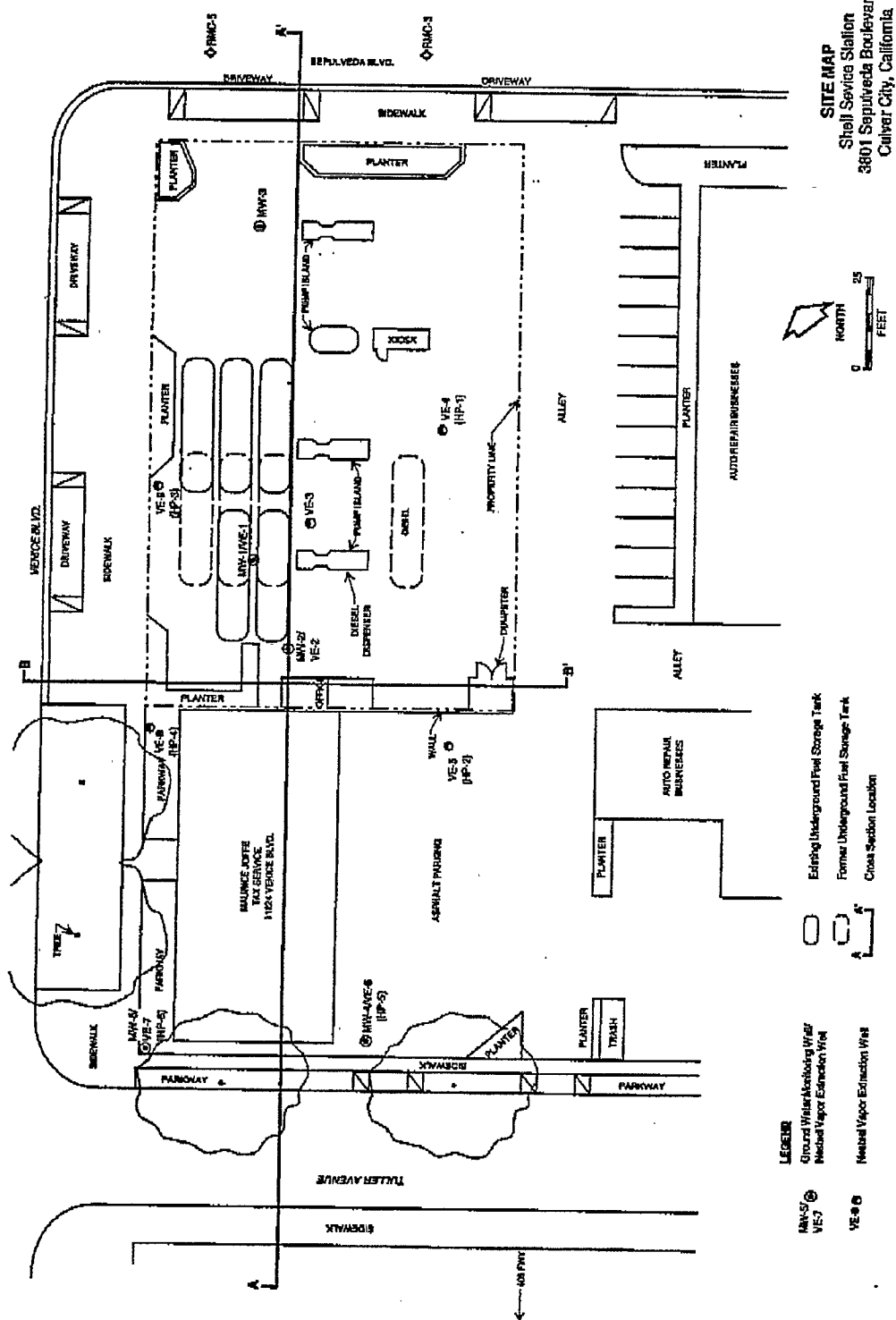
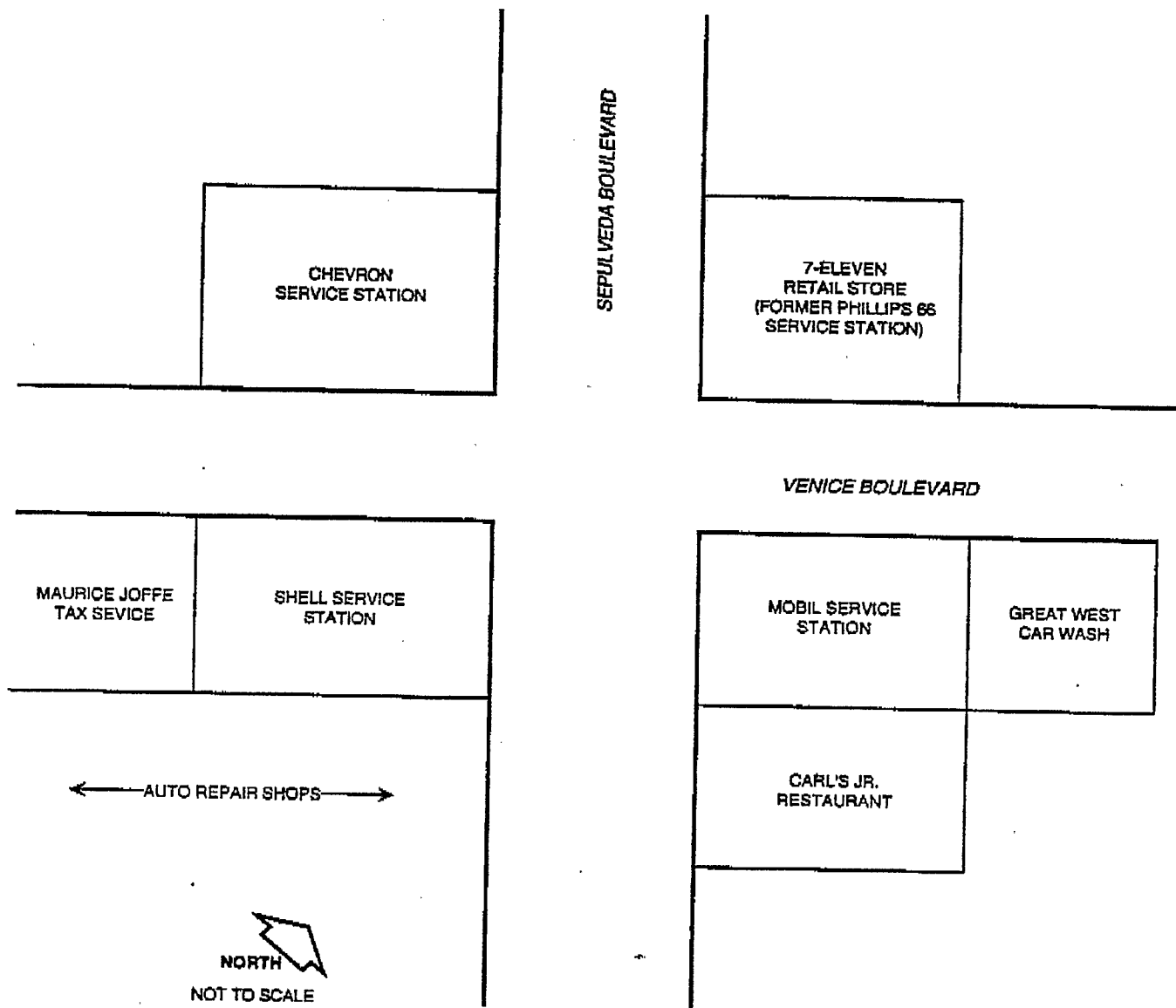


PLATE 3



ADJACENT LAND USE MAP
Shell Service Station
3801 Sepulveda Boulevard
Culver City, California

PLATE 4

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**Table 1. Tank, Piping, and Dispenser Removal
Verification Soil Sample Laboratory Results**

Analyses Performed: Total Petroleum Hydrocarbons (TPH),
EPA Method 8015 Modified for Gasoline or Diesel
Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX),
EPA Method 8020
Organic Lead, CAL/EPA Draft Method

Sample	Data in Parts Per Million (ppm)						
	TPH Gasoline	TPH Diesel	B	T	E	X	Organic Lead
Below Underground Fuel Storage Tanks							
1A	---	ND	ND	0.20	0.13	0.60	---
1B	---	ND	ND	0.16	ND	0.33	---
2A	1987	---	17	445	122	1,040	0.5
2B	ND	---	ND	ND	ND	ND	0.6
3A	2.3	---	ND	0.17	ND	0.46	---
3B	0.6	---	ND	ND	ND	ND	---
4A	1.7	---	ND	ND	ND	0.24	---
4B	ND	---	ND	ND	ND	0.24	---
Below Fuel Dispensers and Product Lines							
D-1	30.6	---	0.05	2.1	0.2	7.1	---
D-2	27.4	---	0.05	1.4	0.08	4.3	---
D-3	ND	---	0.05	0.05	ND	0.04	---
D-4	2.312.5	---	18	73	69	930.7	---
D-5	ND	ND	0.06	0.06	0.02	0.08	---
L-1	ND	---	0.06	0.04	ND	0.04	---
Spill Site Samples							
SP-1, SP-5	1.2	---	0.3	ND	ND	ND	---
SP-2, SP-3, SP-4	1.0	---	ND	ND	0.15	0.36	---
SP-6, SP-7	1.2	---	ND	ND	ND	0.69	---
SP-8	ND	---	0.06	0.04	ND	0.2	---
SP-9	ND	---	0.04	0.04	ND	0.06	---
Detection Limit	0.5	10	0.005	0.005	0.005	0.015	0.5

ND Not detected
Analysis by Crosby Labs, Inc.

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Table 2. Soil Boring - Soil Sample Laboratory Results

Analyses Performed: Total Petroleum Hydrocarbons (TPH),
EPA Method 8015 Modified for Gasoline
Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX), EPA Method 8020
Organic Lead, CAL/EPA Draft Method

Depth Below Grade (feet)	Data in parts per million (ppm)					
	TPH (gasoline)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Organic Lead
BORING B-1 (MW-1)						
25	12,851	224.293	1,432	278.877	1,754	ND
30	1,878	15.431	167.560	36.970	256.861	ND
35	11,131	246.427	1,267	220.338	1,434	ND
40	9,520	170.438	847.768	165.436	1,290	ND
45	1,851	8.783	123.907	43.000	282.642	ND
50	1,392	7.069	97.353	34.120	235.539	ND
55	3,406	22.516	326.476	80.217	477.574	ND
60	2,021	14.322	187.602	47.200	290.699	ND
65	4,126	57.417	414.158	84.347	580.494	ND
75	2,725	18.040	221.801	62.241	365.619	ND
80	ND	ND	ND	ND	ND	ND
85	ND	ND	0.173	ND	ND	ND
90	24.9	ND	0.575	0.299	1.624	ND
95	ND	ND	0.235	0.288	1.157	ND
100	ND	0.175	0.110	0.302	1.670	ND
BORING B-2 (MW-2)						
5	ND	ND	ND	ND	ND	ND
10	ND	ND	ND	ND	ND	ND
15	ND	ND	ND	ND	ND	ND
20	ND	ND	ND	ND	ND	ND
25	ND	ND	ND	ND	ND	ND
30	ND	0.095	ND	ND	0.183	ND
35	ND	0.105	ND	ND	0.194	ND
40	ND	ND	ND	0.074	0.294	ND
45	ND	0.121	ND	ND	ND	ND
50	ND	ND	ND	ND	ND	ND
55	ND	ND	ND	ND	ND	ND
60	ND	ND	0.181	ND	0.314	ND
65	20	0.061	0.168	0.801	0.557	ND
70	8,356	146.997	941.525	186.151	1,051	ND
75	5,091	87.682	554.591	107.931	641.420	ND
80	2,027	24.957	207.714	44.223	258.153	ND
85	4,316	67.367	462.990	94.941	573.698	ND
90	9,660	139.584	879.241	181.652	1,099	ND
95	4,951	52.652	275.102	72.857	593.229	ND
105	71	1.898	6.915	1.385	8.538	ND

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Table 2. (Continued)

Depth Below Grade (feet)	Data in parts per million (ppm)					
	TPH (gasoline)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Organic Lead
BORING B-3 (VE-3)						
5	ND	ND	ND	ND	ND	ND
10	ND	ND	ND	ND	ND	ND
15	ND	ND	ND	ND	ND	ND
20	ND	ND	ND	ND	ND	ND
25	20,676	135.346	1,857	575.935	3,905	ND
30	1,377	8.073	102.014	34.432	201.949	ND
35	430	7.691	31.903	5.421	54.401	ND
40	599	5.336	17.360	3.653	24.972	0.5
45	ND	ND	0.071	ND	0.220	ND
MW-3						
55	ND	ND	ND	ND	ND	—
60	ND	ND	ND	ND	ND	—
65	ND	ND	ND	ND	ND	—
70	ND	ND	ND	ND	ND	—
75	ND	ND	ND	ND	ND	—
80	ND	0.018	0.033	0.006	0.090	—
85	ND	ND	ND	ND	ND	—
90	ND	ND	ND	ND	ND	—
100	ND	ND	ND	ND	ND	—
MW-4/VE-6 (HP-5)						
55	ND	0.019	0.024	0.009	0.067	—
60	ND	ND	ND	ND	ND	—
65	ND	ND	ND	ND	ND	—
70	ND	ND	ND	ND	ND	—
75	ND	ND	ND	ND	ND	—
80	ND	ND	ND	ND	ND	—
85	ND	ND	ND	ND	ND	—
90	ND	ND	ND	ND	ND	—
MW-5/VE-7 (HP-6)						
50	ND	ND	ND	ND	ND	—
55	ND	ND	ND	ND	ND	—
60	ND	ND	ND	ND	ND	—
65	ND	ND	ND	ND	ND	—
70	ND	ND	ND	ND	ND	—
75	ND	ND	ND	ND	ND	—
80	ND	ND	ND	ND	ND	—
85	ND	ND	ND	ND	ND	—
90	ND	ND	ND	ND	ND	—
95	ND	ND	ND	ND	ND	—
100	7514	154.321	515.818	48.997	260.332	—

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Table 2. (Continued)

Depth Below Grade (feet)	Data in parts per million (ppm)					
	TPH (gasoline)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Organic Lead
VE-4 (IIP-1)						
50	ND	0.009	0.007	ND	ND	—
55	ND	ND	ND	ND	ND	—
60	ND	0.017	0.021	ND	0.020	—
65	ND	0.007	0.012	ND	ND	—
70	ND	ND	ND	ND	ND	—
75	ND	ND	ND	ND	ND	—
80	ND	ND	ND	ND	ND	—
85	ND	ND	ND	ND	ND	—
90	ND	0.069	0.967	0.203	1.521	—
VE-5 (IIP-2)						
55	ND	ND	ND	ND	ND	—
60	ND	ND	ND	ND	ND	—
65	ND	ND	ND	ND	ND	—
70	ND	ND	ND	ND	ND	—
75	ND	ND	ND	ND	ND	—
80	ND	ND	ND	ND	ND	—
85	ND	ND	ND	ND	ND	—
90	ND	ND	ND	ND	ND	—
95	ND	ND	ND	ND	ND	—
VE-8 (IIP-4)						
30	ND	ND	ND	ND	ND	—
35	ND	ND	ND	ND	ND	—
40	ND	ND	ND	ND	ND	—
45	ND	ND	ND	ND	ND	—
50	ND	0.098	0.169	0.027	0.165	—
55	ND	ND	ND	ND	0.020	—
60	ND	ND	ND	ND	ND	—
65	ND	ND	ND	ND	ND	—
70	ND	0.012	0.028	ND	0.023	—
75	ND	ND	ND	ND	ND	—
80	ND	ND	ND	ND	ND	—
85	ND	ND	0.013	ND	ND	—
90	ND	0.008	0.016	ND	ND	—
95	ND	0.010	0.183	0.045	0.357	—
100	10169	46.633	725.433	261.160	1531	—

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Project No. 92-41-2850

Table 2. (Continued)

Depth Below Grade (feet)	Data in parts per million (ppm)					
	TPH (gasoline)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Organic Lead
VE-9 (HP-3)						
25	ND	ND	ND	ND	ND	—
30	ND	ND	ND	ND	ND	—
35	ND	ND	ND	ND	ND	—
40	ND	ND	ND	ND	ND	—
45	ND	ND	ND	ND	ND	—
50	ND	0.006	0.021	ND	0.036	—
55	ND	ND	0.012	ND	ND	—
60	11	0.045	0.600	0.310	1.276	—
65	ND	ND	ND	ND	ND	—
70	ND	ND	ND	ND	ND	—
75	ND	ND	ND	ND	ND	—
80	ND	0.211	0.469	0.077	0.526	—
85	ND	0.317	0.483	0.040	0.268	—
90	ND	0.018	0.020	0.014	0.077	—
Detection Limits	10	0.005	0.005	0.005	0.015	0.5

Analyses by Crosby Labs, Inc.

ND Not detected
— Not analyzed

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Project No. 92-41-2850

Table 3. Ground Water Sample Laboratory Results

Analysis performed: total petroleum hydrocarbons (TPH), CAL/EPA Draft Method modified for gasoline, EPA 8015M
Benzene, toluene, ethylbenzene, total xylenes (BTEX), EPA 8020
Organic lead, CAL/EPA Draft Method

Date	Data in Parts per Million (ppm)					
	TPH - gasoline	Benzene	Toluene	Ethylbenzene	Total Xylenes	Organic Lead
Monitoring Well MW-1						
09/13/93	46.4	0.6685	4.6550	2.676	10.1736	ND
03/08/94	42.7	2.3054	2.8503	1.4157	5.1437	ND
06/30/94	75.1	4.0804	13.1258	2.5420	13.0087	-
MW-2						
09/13/93	Not Sampled - Free Product					
03/08/94	Not Sampled - Free Product					
06/30/94	Not Sampled - Free Product					
MW-3						
07/03/94	65.3	1.4813	9.5793	3.7942	22.0662	--
MW-4/VE-6						
06/30/94	76.6	10.9657	23.0083	2.0589	10.8565	-
MW-5/VE-7						
06/30/94	Not Sampled - Free Product					
VE-4						
06/30/94	119.8	5.2079	47.6196	4.7595	26.5390	--
VE-5						
06/30/94	180.6	19.7515	36.7351	4.3751	23.6343	-
VE-8						
06/30/94	Not Sampled - Free Product					
VE-9						
06/30/94	56.9	6.2713	7.5157	1.9464	8.6921	-

ND Not detected
-- Not analyzed
Analyses by Crosby Labs

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Project No. 92-41-2850

Table 4. Well Gauging Data

Date	Data (feet)				
	Relative Well Elevation	Well Depth	Depth to Water	Ground Water Elevation	Free Product Thickness
Monitoring Well MW-1					
09/13/93	61.16	110.01	97.92	-36.16	0
03/08/94	61.16	110.76	102.66	-41.5	0
06/30/94	61.16	110.28	100.82	-39.66	0
Monitoring Well MW-2					
09/13/93	61.66	110.34	102.87 ¹	-41.21 ¹	2.74
03/08/94	61.66	109.76	102.80 ¹	-38.43 ¹	3.04
06/30/94	61.66	109.73	107.23	-38.96 ¹	8.01
Monitoring Well MW-3					
06/30/94	60.72	98.62	87.81	-27.09	0
Monitoring Well MW-4/VE-6					
06/30/94	61.03	118.67	101.42	-40.39	0
Monitoring Well MW-5/VE-7					
06/30/94	61.12	118.66	102.81	-38.61 ¹	3.73
VE-4					
06/30/94	61.00	94.92	90.07	-29.07	0
VE-5					
06/30/94	61.97	109.30	99.91	-37.94	0
VE-8					
06/30/94	60.92	—	—	—	—
VE-9					
06/30/94	60.62	93.96	89.45	-28.83	0

¹ Adjusted for free product levels

August 1994
Project No. 82-41-2860

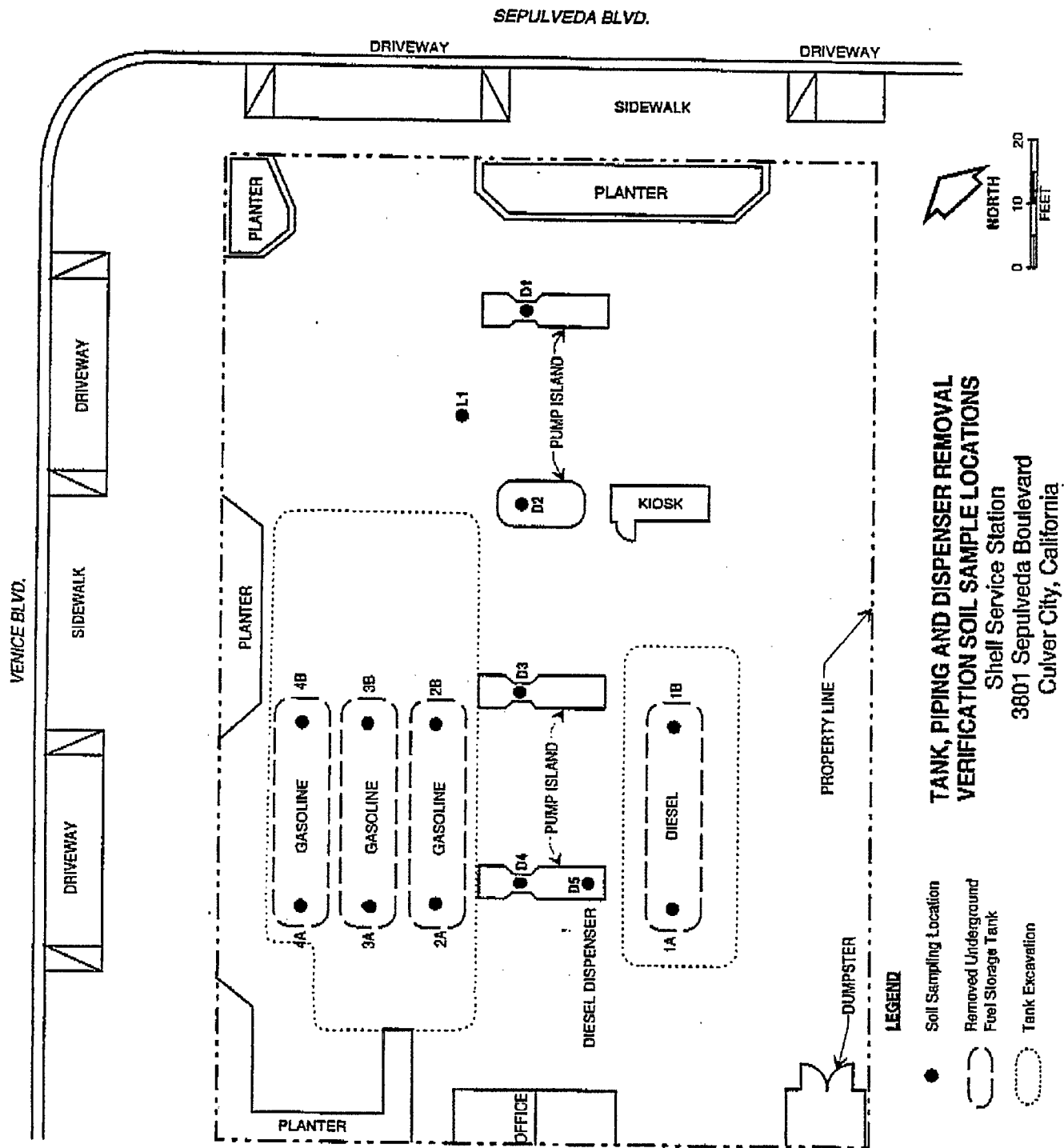


PLATE 2

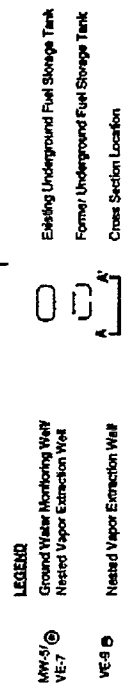
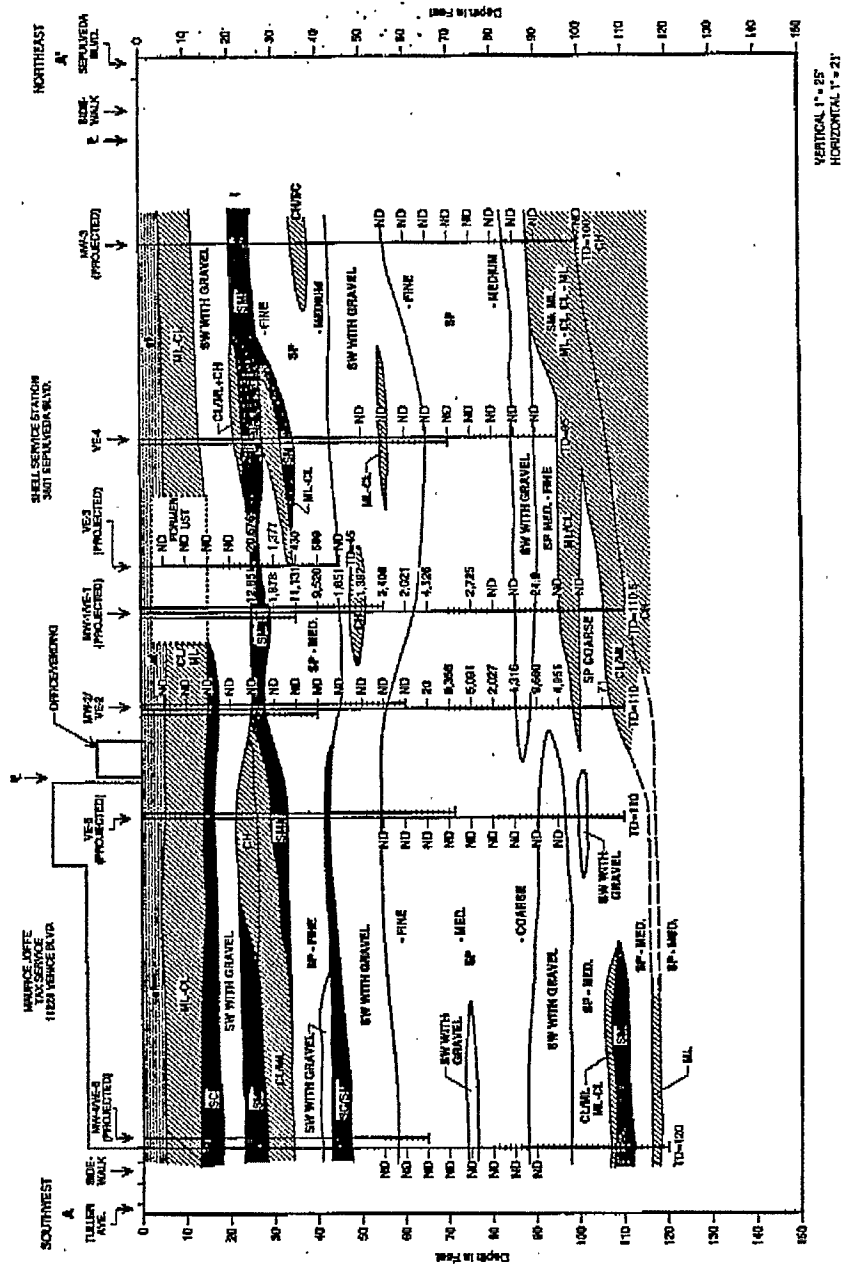


PLATE 3

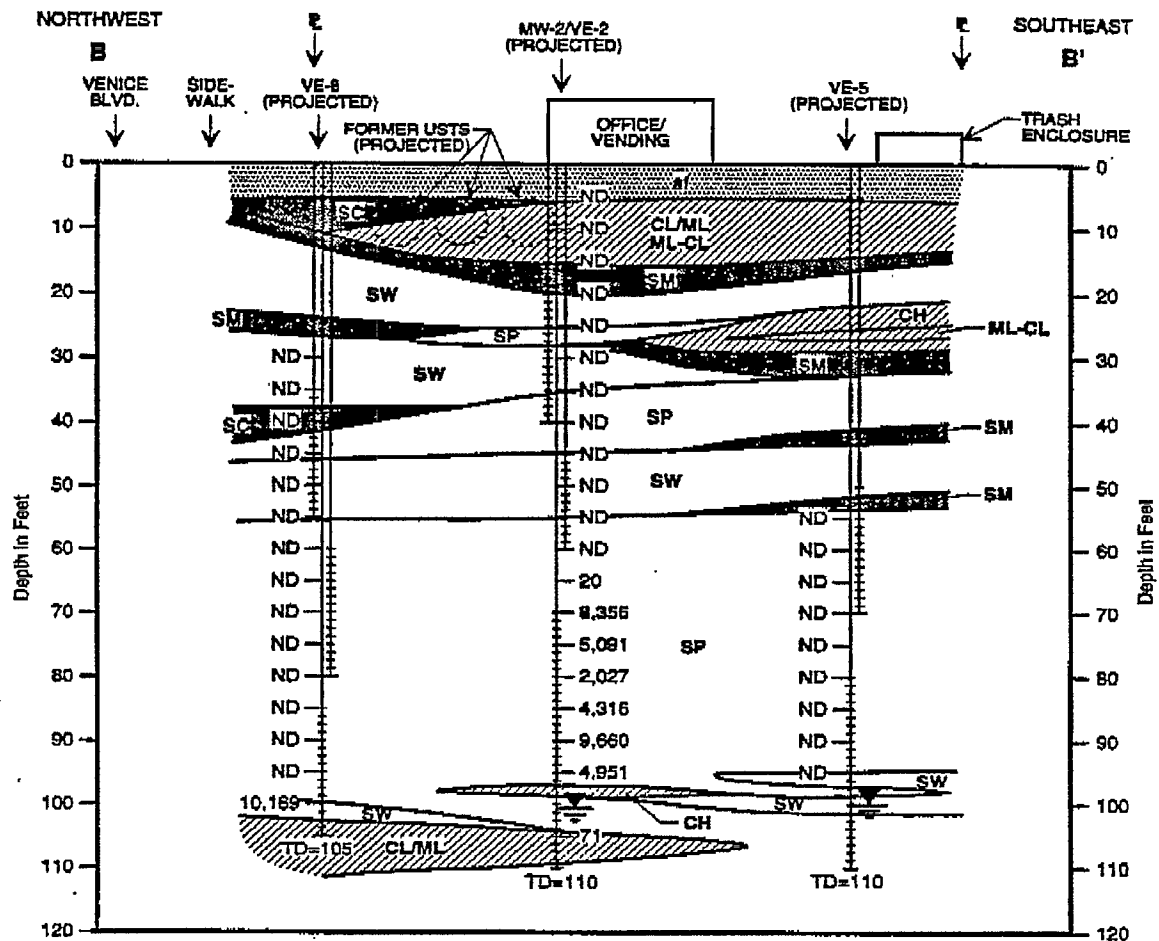
August 1964
Project No. 92-41-2850



CROSS SECTION A-A'
Shell Service Station
3801 Sepulveda Blvd.
Culver City, California

PLATE 5

August 1994
Project No. 92-41-2850

**LEGEND**

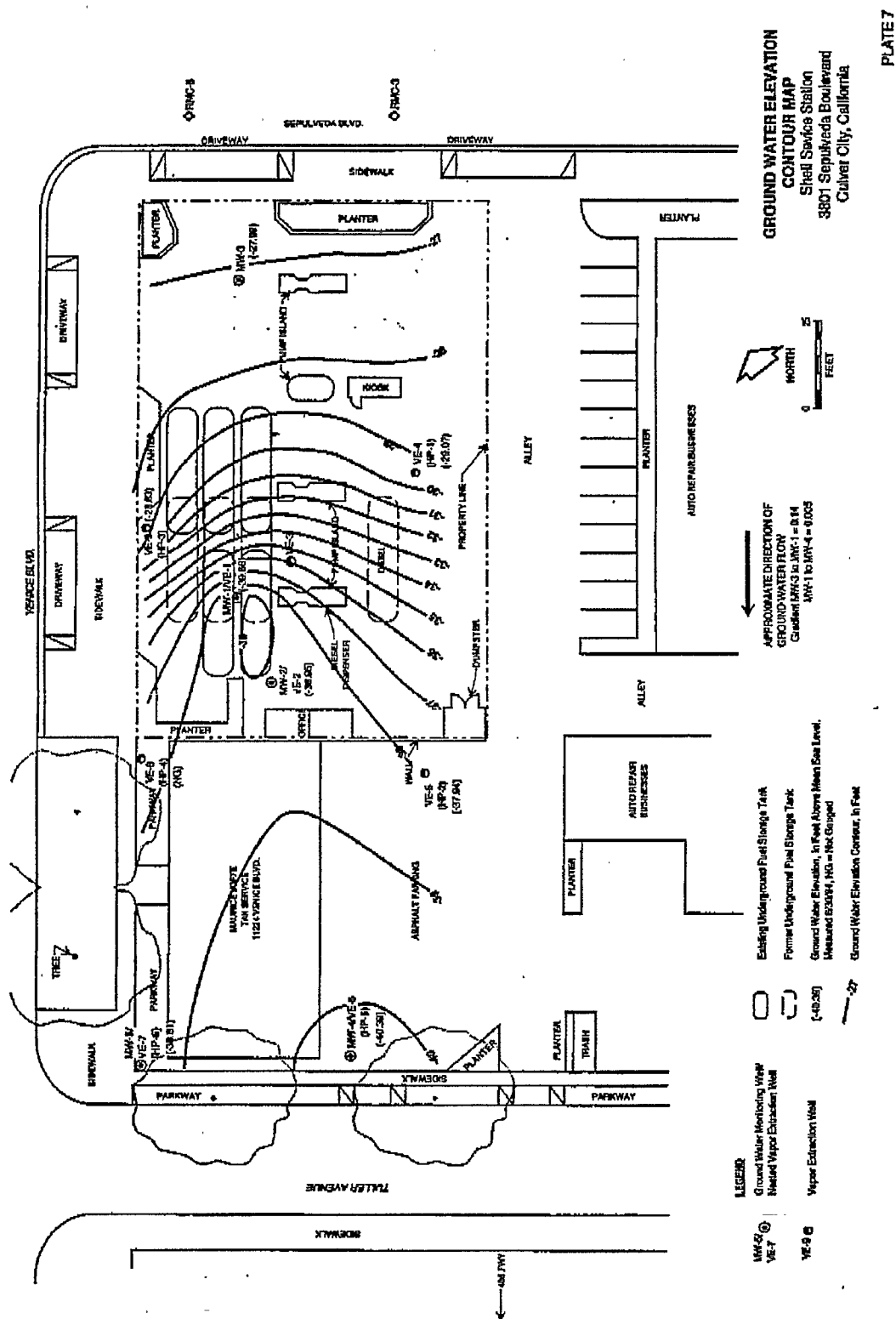
- ARTIFICIAL FILL**
- Silty Clay, Clayey Sand, Silty Sand
- QUATERNARY ALLUVIUM**
- CH, CL/ML, ML-CL: Clay, Silty Clay, Clayey Silt
 - SC, SM, SP: Clayey Sand, Silty Sand
 - SP, SW: Poorly Graded Sand, Well Graded Sand

- 8,356: TPH-Gasoline Concentration (EPA 8015M) in ppm
- Screened Interval of Ground Water Monitoring/Soil Vapor Extraction Well
- Water Level Measured 6/30/94

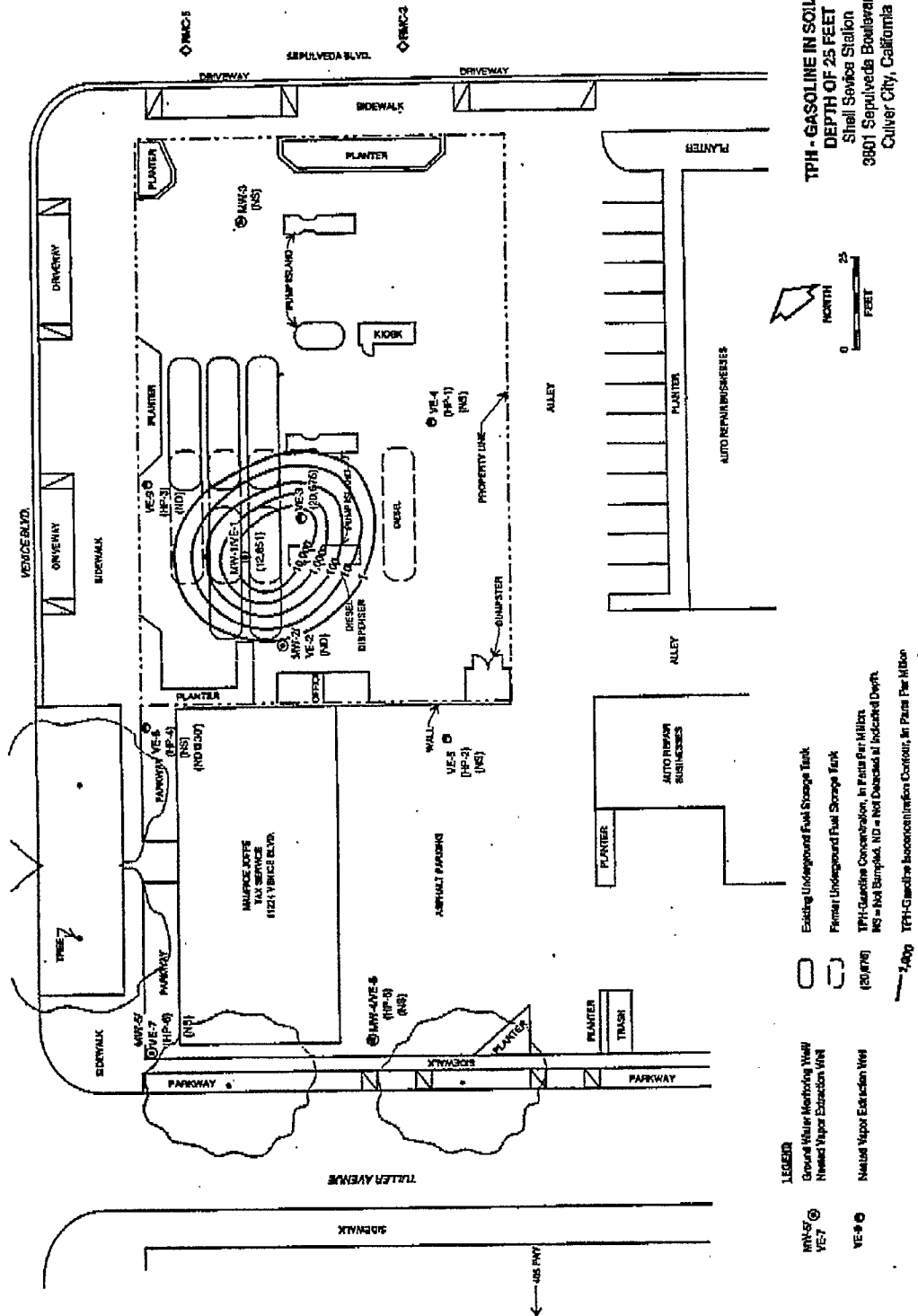
VERTICAL 1" = 25'
HORIZONTAL 1" = 25'

CROSS SECTION B-B'
Shell Service Station
3801 Sepulveda Blvd.
Culver City, California

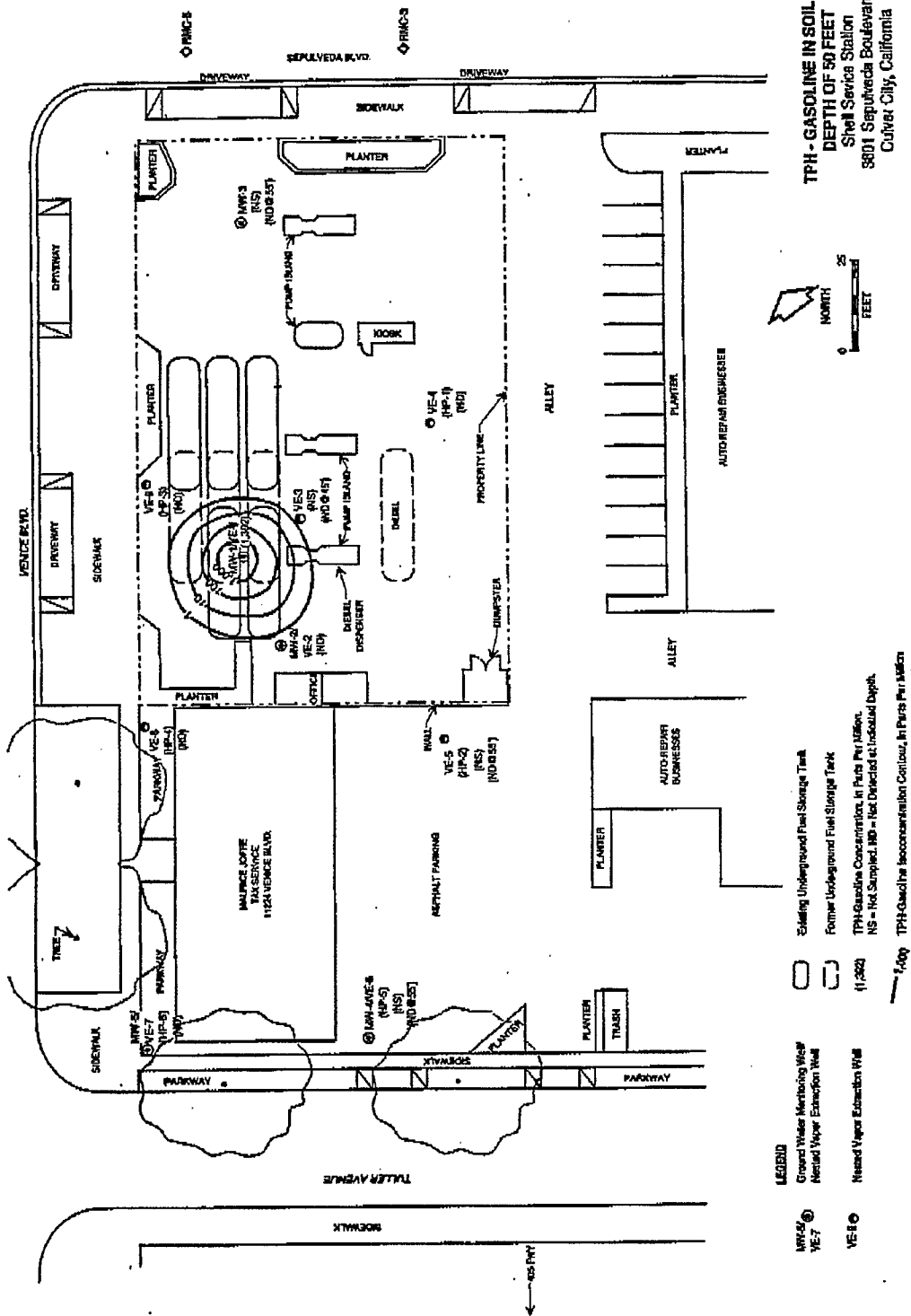
PLATE 6



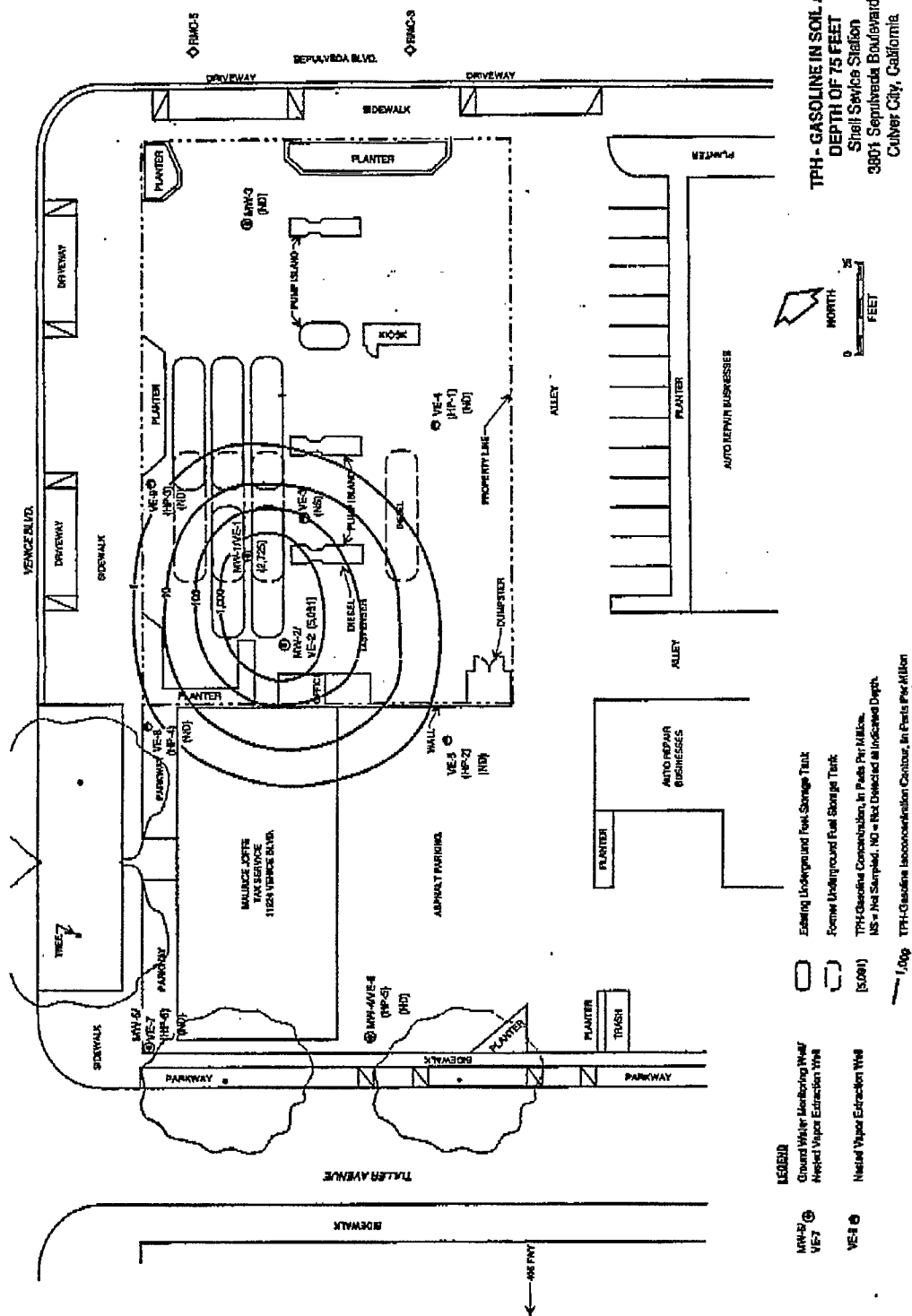
August 1994
Project No. 92-41-2650



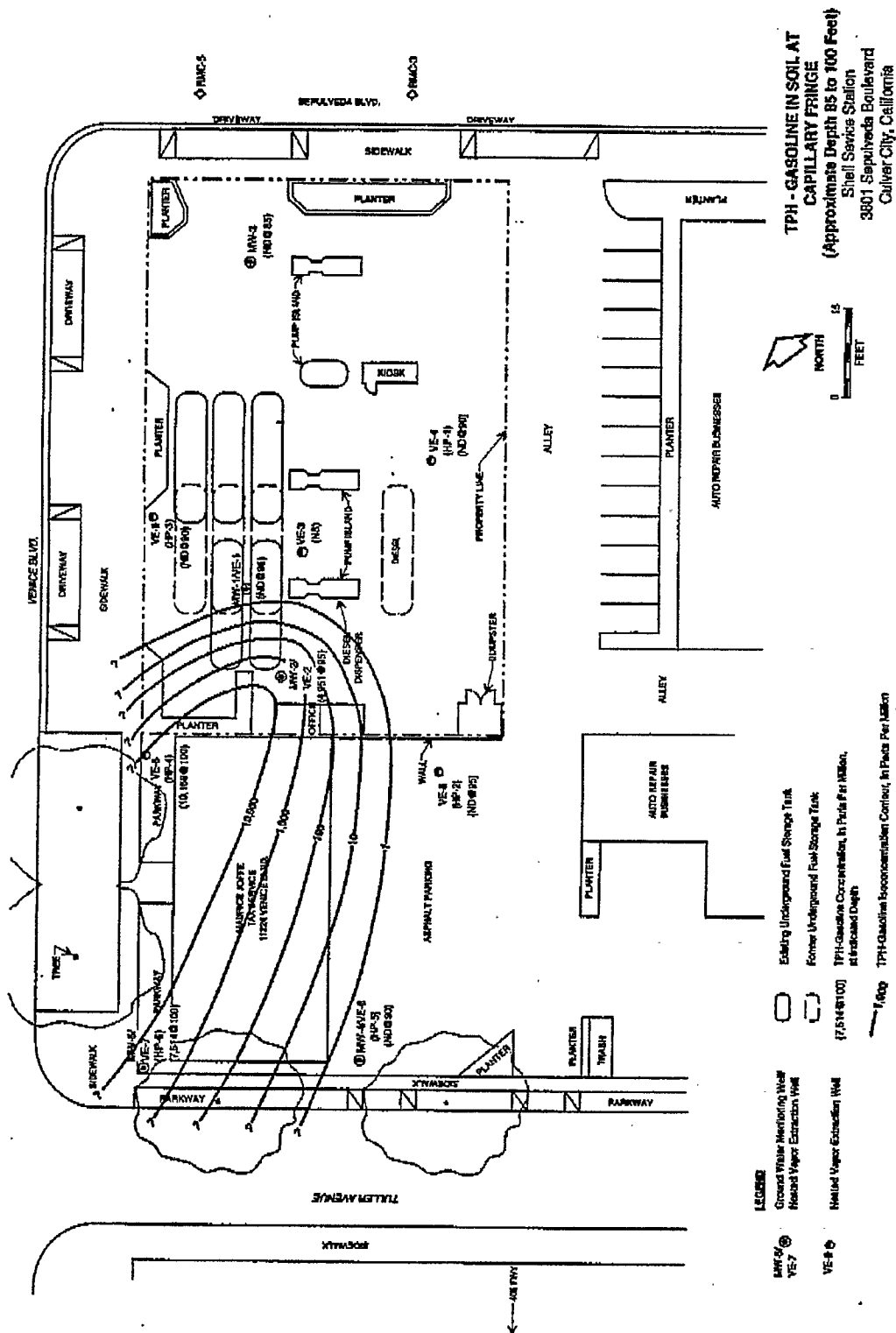
August 1994
Project No. 82-41-0850



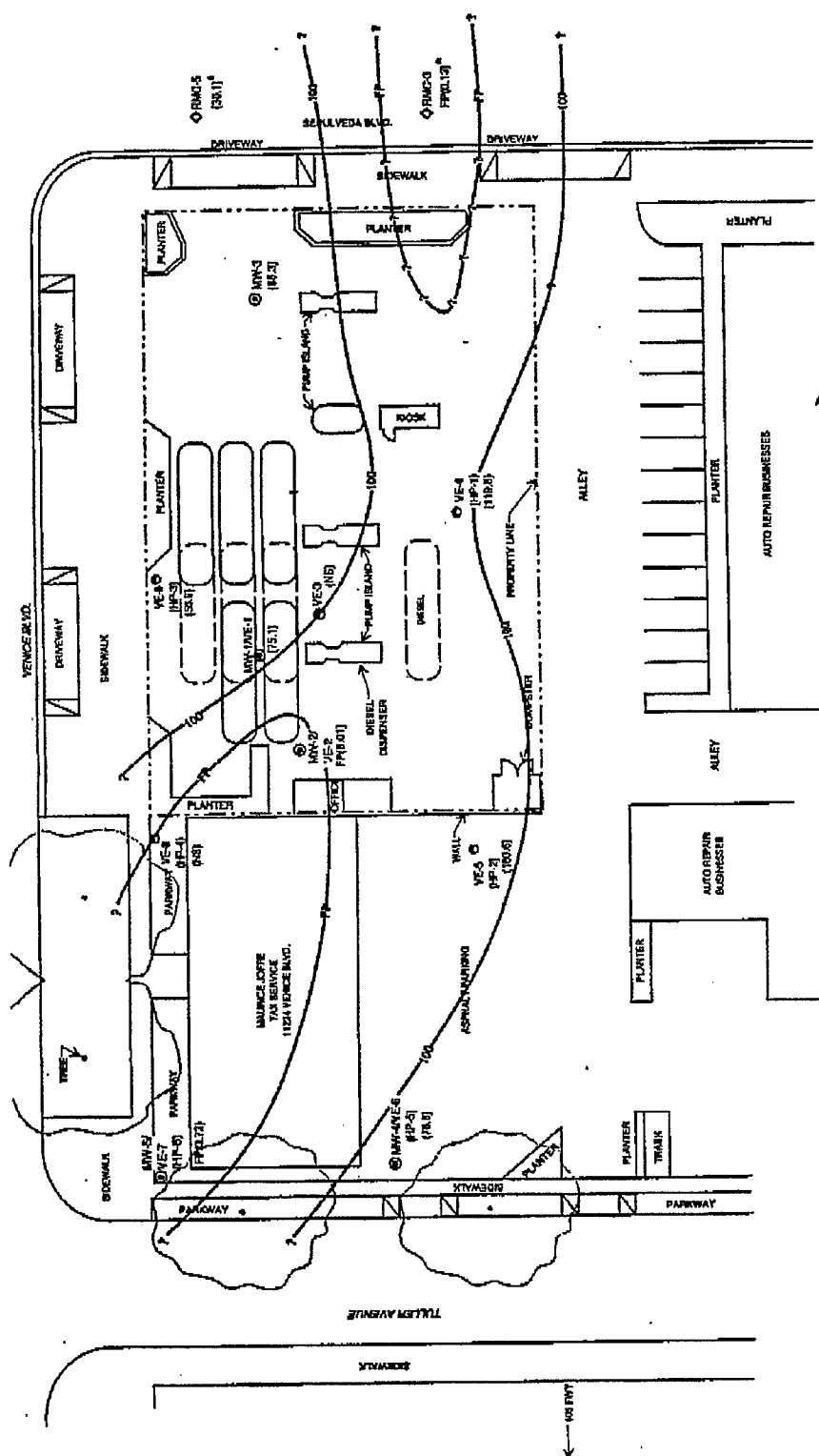
August 1994
Project No. 92-41-2550



August 1994
Project No. 92-41-2850



August 1994
Project No. 92-41-2859



TPH - GASOLINE IN GROUND WATER
SECOND QUARTER, 1994
Shell Service Station
3801 Sepulveda Boulevard
Culver City, California

PLATE 12

Sampled/Measured by Eupro 8/13/93
Top TPH-Gasoline Concentration Corridor,
In Parts Per Million

Existing Underground Fuel Storage Tank
Former Underground Fuel Storage Tank
TPH-Gasoline Concentration, In Parts Per Million,
Sampled 6/20/94 and 7/10/94. NS = Not Sampled
Free Phase Gasoline, Thickness in Feet,
Measured 6/20/94

LEGEND

MW-3
MW-7
MW-9
MW-10
MW-11
MW-12
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MW-98
MW-99
MW-100

Ground Water Monitoring Well
Ground Water Extraction Well
Neutered Vapor Extraction Well
Neutered Vapor Extraction Well

FP (M01)

August 1964
Project No. B2-41-2850

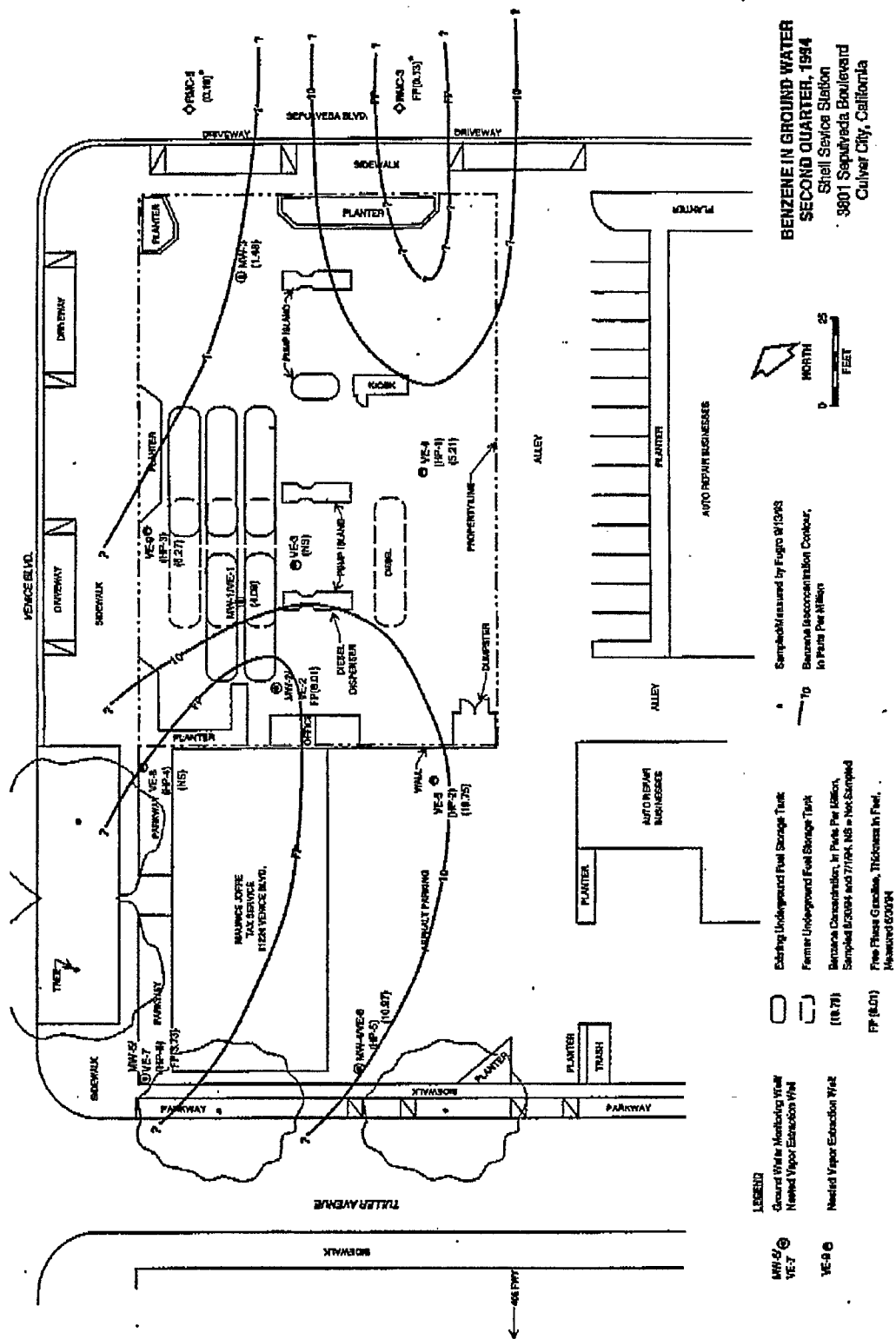


PLATE 19